

WHAT IS CLAIMED IS:

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1. A polyester film comprising:
a polyester resin; and
a thermoplastic resin other than a polyester resin;
wherein the number H1 of coarse projections having a height of 0.28 μm or more per 100 cm^2 of at least one surface of the polyester film, and the number H2 of coarse projections having a height of 0.56 μm or more per 100 cm^2 of said at least one surface of the polyester film satisfy the conditions:

$$0 \leq H1 \leq 100 \text{ and } 0 \leq H2 \leq 10.$$

2. A polyester film according to claim 1,
wherein the polyester resin and the thermoplastic resin forms a base layer portion, and
further comprising a first laminated portion provided on at least one surface of the base layer portion.

3. A polyester film according to claim 1, wherein the polyester resin comprises an ethylene terephthalate unit or ethylene(2,6-naphthalenedicarboxylate) unit as a primary component.

4. A polyester film according to claim 3, wherein the

✓ polyester resin comprises an ethylene terephthalate unit as a primary component.

✓ 5. A polyester film according to claim 1, wherein the thermoplastic resin has a glass transition temperature which is equal to or higher than that of the polyester resin.

✓ 6. A polyester film according to claim 1, wherein the thermoplastic resin is at least one thermoplastic resin selected from the group consisting of a polyimide resin, a polysulfone resin, and a poly(ether sulfone) resin.

✓ 7. A polyester film according to claim 6, wherein the thermoplastic resin is the polyimide resin.

✓ 8. A polyester film according to claim 7, wherein the thermoplastic resin is the poly(ether imide) resin.

✓ 9. A polyester film according to claim 1, wherein the content of the thermoplastic resin in the polyester film is 1 to 30 wt%.

✓ 10. A polyester film according to claim 1, wherein the content of the thermoplastic resin in the polyester film is 5 to 30 wt%.

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✓ 11. A polyester film according to claim 1, wherein the polyester film has an extrapolated glass transition-starting temperature of 90 to 150°C.

12. A polyester film according to claim 1, further comprising particles having a ratio of the actual average particle diameter D_v to the weight average particle diameter D of 1 to 3.

13. A polyester film according to claim 2, wherein the base layer portion comprises 0.001 to 1 wt% of particles having a weight average particle diameter D of 0.001 to 0.5 μm , and the first laminated portion comprises 0.001 to 3 wt% of particles having a weight average particle diameter D of 0.01 to 1.0 μm .

✓ 14. A polyester film according to claim 2, wherein the base layer portion comprises a polyester resin and a polyimide resin, and the surface roughness $Ra(b)$ at the first laminated portion side and the surface roughness $Ra(f)$ at the side opposite to the first laminated portion satisfy the formulas below,

$$3 \text{ nm} \leq Ra(b) \leq 15 \text{ nm},$$

$$0.5 \text{ nm} \leq Ra(f) \leq 10 \text{ nm}, \text{ and}$$

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$$1 \text{ nm} \leq \text{Ra}(\text{b}) - \text{Ra}(\text{f}) \leq 7 \text{ nm}.$$

15. A polyester film according to claim 2, wherein the base layer portion comprises a polyester resin and a polyimide resin, projections having a height of 5 to 25 nm exist on an f surface opposite to the first laminated portion of the polyester film at a density of 5,000,000 to 70,000,000/mm², and the surface roughness Ra(f) at the f surface side and the surface roughness Ra(b) of the surface at the first laminated portion side satisfy the formulas below,

$$0.1 \text{ nm} \leq \text{Ra}(\text{f}) \leq 5 \text{ nm}, \text{ and}$$

$$5 \text{ nm} \leq \text{Ra}(\text{b}) \leq 20 \text{ nm}.$$

16. A polyester film according to claim 2, wherein the base layer portion comprises a polyester resin and a polyimide resin, the first laminated portion is provided on one surface of the base layer portion and comprises 0.05 to 1.5 wt% of particles having a weight average particle diameter of 0.05 to 1 μm and a polyester resin or a material composed of a polyester resin and a polyimide resin, and further comprising a layer which is provided on at least the surface opposite to the first laminated portion of the polyester film and which comprises a water-soluble polymer and particles having a weight average particle diameter of 7

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to 25 nm at a content of 3,000,000 to 70,000,000/mm².

17. A polyester film according to claim 2, wherein the base layer portion comprises a polyester resin and a polyimide resin, the first laminated portion is provided on one surface of the base layer portion and comprises 0.05 to 1.5 wt% of particles having a weight average particle diameter of 0.05 to 1 μ m and a polyester resin or a material composed of a polyester resin and a polyimide resin, and further comprising a second laminated portion which is provided on the polyester film at the side opposite to the first laminated portion and which comprises 0.1 to 3 wt% of particles having a weight average particle diameter of 10 to 50 nm and a polyester resin or a material composed of a polyester resin and a polyimide resin, whereby a structure having at least three layers is formed.

✓ 18. A polyester film according to claim 1, wherein the total thickness of the polyester film is 1 to 15 μ m.

✓ 19. A polyester film according to claim 1, wherein the total thickness of the polyester film is 3 to 8 μ m.

✓ 20. A polyester film according to claim 1, wherein the Young's modulus in the longitudinal direction is 5.5 GPa or

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✓ more, and the sum of the Young's moduli in the longitudinal direction and in the width direction is 10 to 25 GPa.

✓ 21. A polyester film according to claim 1, wherein the Young's modulus in the longitudinal direction is 4.3 GPa or more, the Young's modulus in the width direction is 4.7 GPa or more, and the sum of the Young's moduli in the longitudinal direction and in the width direction is 9 to 20 GPa.

✓ 22. A polyester film according to claim 1, wherein the heat shrinkage of the polyester film in the longitudinal direction at 100°C for 30 minutes is 1.2% or less, and the heat shrinkage in the width direction at 100°C for 30 minutes is 0.5% or less.

✓ 23. A polyester film according to claim 1, wherein the heat shrinkage of the polyester film in the longitudinal direction at 80°C for 30 minutes is 0.3% or less, and the heat shrinkage in the width direction at 80°C for 30 minutes is 0.1% or less.

✓ 24. A polyester film according to claim 1, wherein, when the polyester film is held under the conditions of a temperature of 60°C and a relative humidity of 80% for 72

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hours while being subjected to a load of 26 MPa in the longitudinal direction, the rate of change in the dimensions in the width direction is in the range of -0.4 to 0%.

25. A polyester film according to claim 1, wherein the polyester film is used for a magnetic recording medium.

26. A magnetic recording medium comprising:
a polyester film according to Claim 1; and
a magnetic layer provided on at least one surface of the polyester film.

27. A magnetic recording medium according to Claim 26, wherein the magnetic layer comprises a ferromagnetic metal thin-film.

28. A magnetic recording medium according to Claim 26, wherein the magnetic layer comprises finely powdered ferromagnetic hexagonal ferrite dispersed in a bonding agent.

29. A digital recording type cassette tape comprising a magnetic recording medium according to Claim 26.

30. A polyester film having a thickness of 3 to 8 μm and used for a magnetic recording medium, comprising:

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a base layer portion comprising a polyester resin and a polyimide resin;

a first laminated portion which is provided on one surface of the base layer portion and which contains 0.05 to 1.5 wt% of particles having a weight average particle diameter of 0.05 to 1 μm and a polyester resin or a material composed of a polyester resin and a polyimide resin, the base layer portion and the laminated portion forming a base film; and

a layer which is provided on at least the surface opposite to the first laminated portion of the base film and which contains a water-soluble polymer and inert particles having a weight average particle diameter of 7 to 25 nm at a content of 3,000,000 to 70,000,000/ mm^2 .

31. A polyester film having a thickness of 3 to 8 μm and used for a magnetic recording medium, comprising:

a base layer portion comprising a polyester resin and a polyimide resin;

a first laminated portion which is provided on one surface of the base layer portion and which contains 0.05 to 1.5 wt% of particles having a weight average particle diameter of 0.05 to 1 μm and a polyester resin or a material composed of a polyester resin and a polyimide resin, the base layer portion and the laminated portion forming a base

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film; and

a second laminated portion which is provided on the base film at the side opposite to the first laminated portion and which contains 0.1 to 3 wt% of particles having a weight average particle diameter of 10 to 50 nm and a polyester resin or a material composed of a polyester resin and a polyimide resin, whereby a structure having at least three layers is formed.

32. A method for manufacturing a polyester film comprising:

a step of filtrating a polymer mixture comprising a polyester resin and a polyimide resin through a fiber sintered stainless steel filter having a cut of 1.2 μm or less in an extruder;

a step of melt-extruding the polymer mixture through an extruding die for forming an unstretched film by using the extruder;

a step of stretching the unstretched film in the longitudinal direction at a stretching temperature of $T_g + 10^\circ\text{C}$ to $T_g + 30^\circ\text{C}$, at a stretching ratio of 2.5 to 4.0, and at a stretching rate of 50,000%/minute to 200,000%/minute in at least two stages;

a step of stretching the stretched film in the width direction at a stretching temperature of $T_g + 10^\circ\text{C}$ to $T_g +$

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50°C, at a stretching ratio of 3.0 to 4.5, and at a stretching rate of 2,000%/minute to 10,000%/minute;

a step of further stretching the stretched film in the longitudinal direction at a stretching temperature of $T_g + 30^\circ\text{C}$ to $T_g + 50^\circ\text{C}$, and at a stretching ratio of 1.2 to 1.8;

a step of further stretching the stretched film in the width direction at a stretching temperature of $T_g + 80^\circ\text{C}$ to $T_g + 110^\circ\text{C}$, and at a stretching ratio of 1.2 to 2.0; and

a step of performing heat treatment at a temperature of $T_g + 100^\circ\text{C}$ to $T_g + 125^\circ\text{C}$ for 0.2 to 10 seconds.

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